Amendments To The Specification:

Please replace the title at the beginning of page 1 with the following new title:

TITLE: ~~IN-SITU MIRROR CHARACTERIZATION~~APPARATUS AND METHOD FOR MEASURING MIRRORS IN SITU

Please replace the paragraph beginning at page 5, line 2, with the following rewritten paragraph:

--To achieve alignment, it is known to use dynamic interferometers in which distance measurements are enhanced through the use of dynamic elements whose angular orientation is controlled via feedback arrangements to assure that beams carrying distance information are properly aligned to provide optimal signal. Such interferometers are shown, for example, in International Application No. PCT/US00/12097 filed May 5, 2000, and entitled "Interferometry Systems Having a Dynamic Beam-Steering Assembly For Measuring Angle and Distance " by Henry A. Hill, Published November 19, 2000 as International Publication No. WO 00/66969 and corresponding to US Patent No. 6,271,923 of the same title and inventor issued on August 7, 2001. However, even with dynamic interferometers the shape of various reflecting elements impacts on the achievable accuracy in distance measurements and impacts on the achievable accuracy in angle measurements, because for the latter local slope changes influence beam directions, as stage mirrors undergo their various motions. Typically, the shape of such reflecting elements, such as thin high aspect ratio mirrors, is characterized off-stage and, if judged to be of adequate consistency, are then mounted on-stage. However, this is often unacceptable because the mounting process itself distorts the shape of the element compared with its inspected shape, and this change in shape can introduce measurement errors.--

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Please replace the paragraph beginning at page 8, line 24 and ending on page 9, line 5, with the following rewritten paragraph:

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--Fixedly mounted off-stage is a single beam dynamic interferometer (or interferometer subsystem) **10** for measuring angular rotation of stage **16**, and thus planar mirror reflecting surface **51**, about the y and z axes as stage **16** translates in the y-direction. To accomplish this, dynamic interferometer **10** is structured and arranged in the manner described in aforementioned PCT Patent Application No. PCT/US00/10297 filed May 5, ~~2000~~ 2000 and entitled " Interferometry Systems Having a Dynamic Beam-Steering Assembly For Measuring Angle and Distance" by Henry A. Hill which is incorporated herein by reference in its entirety. As described in that application, mirrors are provided with beam steering capability by which bothersome stage rotations are measured to provide feedback signals that are used to maintain beams on paths that are normal to the mirrors. Here, the return beam component of beam **12** is monitored, and its angle is measured via interferometric apparatus such as that described in U.S. Patent Application No. ~~60/201,457~~60/201,457 filed on May 3, 2000 in the name of Henry Allen Hill and entitled "Apparatus And Method(s) For Measuring And/Or Controlling Differential Paths Of Light Beams", now Application No. 09/842,556 filed on April 26, 2001 with title "Dynamic Angle Measuring Interferometer" and Published on March 21, 2002 as US-2002-0033951-A1, the entirely of which is incorporated herein by reference.--

Please replace the two paragraphs beginning at page 9, line 6 and ending at page 10, line 15 with the following:

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--Input beam **12** preferably comprises two orthogonally polarized components having a difference in frequencies f_1. A source of input beam **12** such as a laser can be any of a variety of frequency modulation apparatus and/or lasers. For example, the laser can be a gas laser, *e.g.*, a HeNe laser, stabilized in any of a variety of conventional techniques known to those skilled in the art, see for example, T. Baer *et al.*, "Frequency Stabilization of a ~~0.633~~0.633 μm He-Ne-longitudinal Zeeman Laser," *Applied Optics*, ~~19, 3173-3177~~19,31733177 (~~1980~~1980); Burgwald *et al.*, U.S. Pat. No. ~~3,889,207~~3,889,207, issued June 10, ~~1975~~1975; and Sandstrom *et al.*, U.S. Pat. No. ~~3,662,279~~3,662,279, issued May 9, ~~1972~~1972. Alternatively, the laser can be a diode laser frequency stabilized in one of a variety of conventional techniques known to those skilled in the art, see for example, T. Okoshi and K. Kikuchi, "Frequency Stabilization of Semiconductor Lasers for Heterodyne-type Optical Communication Systems," *Electronic Letters*, **16**, ~~179-181~~179-181 (~~1980~~1980) and S. Yamaqguchi and M. Suzuki, "Simultaneous Stabilization of the Frequency and Power of an AlGaAs Semiconductor Laser by Use of the Optogalvanic Effect of Krypton," *IEEE J. Quantum Electronics*, ~~QE-19, 1514-1519 (1983)~~QE 19, 1514-1518 (1983).

Two optical frequencies may be produced by one of the following techniques: (1) use of a Zeeman split laser, see for example, Bagley *et al.*, U.S. Patent No. ~~3,458,259~~3,458,259, issued July 29, ~~1969~~1969; G. Bouwhuis, "Interferometrie Mit Gaslasers," Ned. T. Natuurk, **34**, ~~225-232 (Aug. 1968)~~225-232 (Aug. 1968); Bagley *et al.*, U.S. Patent No. ~~3,656,853~~3,656,853, issued April 18, ~~1972~~1972; and H. Matsumoto, "Recent interferometric measurements using stabilized lasers," *Precision Engineering*, **6**(2), 87-94 (~~1984~~1984); (2) use of a pair of acousto-optical Bragg cells, see for example, Y. Ohtsuka and K. Itoh, "Two-frequency Laser Interferometer for Small Displacement Measurements in a Low Frequency Range," *Applied Optics*, ~~18(2), 219-224 (1979)~~18(2), 219-224 (1979); N. Massie *et al.*, "Measuring Laser Flow Fields With a 64-Channel Heterodyne Interferometer," *Applied Optics*, ~~22(14), 2141-2151 (1983)~~22(14), 2141-2151 (1983); Y. Ohtsuka and M. Tsubokawa, "Dynamic Two-frequency Interferometry for Small Displacement Measurements," *Optics and Laser Technology*, ~~16, 25-29 (1984)~~16,

25-29 (1984); H. Matsumoto, *ibid.*; P. Dirksen, *et al.*, U.S. Patent No. ~~5,485,272~~5,485,272, issued Jan. 16, ~~1996~~1996; N. A. Riza and M. M. K. Howlader, “Acousto-optic system for the generation and control of tunable low-frequency signals,” *Opt. Eng.*, 35(4), 920-925 (1996) ~~35(4), 920-925 (1996)~~; (3) use of a single acousto-optic Bragg cell, see for example, G. E. Sommargren, commonly owned U.S. Pat. No. **4,684,828**~~4,684,828~~, issued Aug. 4, ~~1987~~1987; G. E. Sommargren, commonly owned U.S. Pat. No. ~~4,687,958~~4,687,958, issued Aug. 18, ~~1987~~1987; P. Dirksen, *et al.*, *ibid.*; (4) use of two longitudinal modes of a randomly polarized HeNe laser, see for example, J. B. Ferguson and R. H. Morris, “Single Mode Collapse in ~~6328~~ 6328 Å HeNe Lasers,” *Applied Optics*, 17(18), 2924-2929 (1978)~~17(18), 2924-2929 (1978)~~; (5) use of birefringent elements or the like internal to the laser, see for example, V. Evtuhov and A. E. Siegman, “A “Twisted-Mode” Technique for Obtaining Axially Uniform Energy Density in a Laser Cavity,” *Applied Optics*, 4(1), 142-143 (1965)~~4(1), 142-143 (1965)~~; or the use of the systems described in U.S. Pat. Application with Serial No. 09/061,928~~09/061,928~~ filed 4/17/98 entitled "Apparatus to Transform Two Non-Parallel Propagating Optical Beam Components into Two Orthogonally Polarized Beam Components" by ~~H. A. Hill~~Henry A. Hill, et al. now US Patent No. 6,236,507 issued on May 22, 2001, the contents of which are incorporated herein by reference.--

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